

On the possible mathematical connections between some topics of Ramanujan's mathematics and various equations regarding Toroidal Compactification, Supersymmetry Breaking, Planck CMB data and Frequency System based on Phi. II

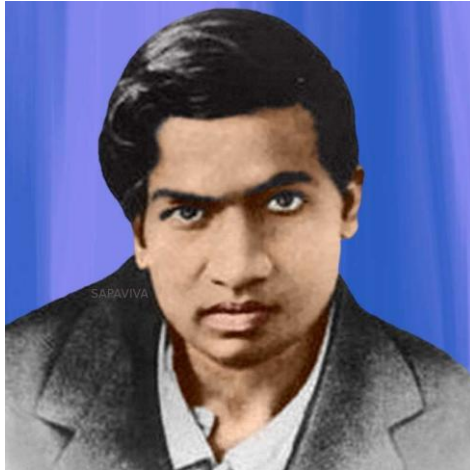
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Abstract

In this research thesis (part II), we analyze new possible mathematical connections between some topics of Ramanujan's mathematics and various equations regarding Toroidal Compactification, Supersymmetry Breaking, Planck CMB data and Frequency System based on Phi

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Srinivasa Ramanujan
(December 22, 1887 – April 26, 1920)



Joel Scherk
(1946-1980)

We want to highlight that the development of the various equations was carried out according to our possible logical and original interpretation

Table 46
 $\Phi^{1/n}$ scale (octave = 4)

#	$\Phi^{1/n}$	Frequency (Hz)
1	1.0000000	306.342
2	1.0711625	328.142
3	1.1473892	351.494
4	1.2290403	376.508
5	1.3165020	403.300
6	1.4101876	432.000
7	1.5105401	462.742
8	1.6180340	495.672
9	1.7331774	530.945
10	1.8565147	568.729
11	1.9886290	609.201
		612.684

Note. Author's calculation with data
 From Lange, Nardelli, & Bini (2013,
 p.3). ©

Table of Frequency System based on Phi

Planck multipole spectrum data

103,1
 103,98
 124,55
 127,88
 162,27
 179,33
 191,16
 208,67
 213,07
 215,63
 218,14
 226,13
 232,56 150802.7363

239,6
250,1
278,34
299,495
319,73
342,35
365,19
373,95
374,45
382,85
387,21
420,02
477,66
554,48
581,438
599,185
620,243
631,571
639,652
645,569
645,593
658,099
658,83
689,45
691,994
704,645
722,68
729,551
732,75
736,931
743,136
746,75
749,62
763,366
768,34
786,337
793,96
797,376
806,23
841,08
889,209
903,34
907,4
917,942

931,293
931,908
973,755
975,998
985,83
1003,34
1006,77
1017,97
1033,69
1034,38
1042,69
1042,9
1065,2
1076,17
1081,01
1113,53
1113,58
1118,05
1140,7
1162,04
1163,21
1170,97
1185,37
1204,04
1254,91
1283,88
1284,54
1298
1298,08
1354,41
1375,35
1402,5
1407,61
1425,6
1580,53
1619,33
1682,61
1691,91
1792,35
1819,88
1836,2
1863,84
1922,19
1927,53

1962,25
2016,71
2030,01
2124,69
2229,41
2237,31
2282,71
2341,59
2345,97
2396,51
2464,71
2484,24
2506,61
3027,82
3123,86
3893,83
4116,06
4867,41
4953,54
5524,53
5703,16

From:

Toroidal compactification and symmetry breaking in open-string theories - *M. Bianchi, G. Pradisi and A. Sagnotti* - Nuclear Physics B 376 (1992) 365—386 North-Holland

Now, we consider

$$K = \frac{1}{2} \frac{\sum_m e^{-2\pi\tau g^{ab} m_a m_b}}{(\eta(2i\tau))^d}, \quad (3.4)$$

$$\tilde{K} = \frac{2^{D/2}}{2} \sqrt{\det(g)} \frac{\sum_n e^{-\pi\tau g_{ab} n^a n^b}}{(\eta(i\tau))^d}, \quad (3.5)$$

where $D = 10$ and $d = 6$

For:

$$R = \sqrt{2},$$

$$m = 6; \quad \eta(\tau) = 1.29927; \quad N = 4$$

from:

Modular equations and approximations to π - Srinivasa Ramanujan
Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

$$g_{22} = \sqrt{(1 + \sqrt{2})}.$$

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \dots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \dots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \dots = 64\{(1 + \sqrt{2})^{12} + (1 - \sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982 \dots$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5 + \sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \dots = 64 \left\{ \left(\frac{5 + \sqrt{29}}{2}\right)^{12} + \left(\frac{5 - \sqrt{29}}{2}\right)^{12} \right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982 \dots$$

From:

$$K = \frac{1}{2} \frac{\sum_m e^{-2\pi\tau g^{ab} m_a m_b}}{(\eta(2i\tau))^d},$$

We consider:

$$e^{-2\pi\tau g^{ab} m_a m_b} = e^{\pi\sqrt{22}}$$

where $D = 10$ and $d = 6$

$$R = \sqrt{2},$$

$$m = 6; \quad \eta(\tau) = 1.29927; \quad N = 4$$

$$1/2 * 1/(1.29927 * 2i)^6 * \sum (e^{(\pi * \sqrt{22}) * m}), m=0..infinity$$

$$1/2 * 1/(1.29927 * 2i)^6 * \sum (e^{(\pi * \sqrt{22}) * x}), x=1..1$$

Input interpretation:

$$\frac{1}{2} \times \frac{1}{(1.29927 \times 2i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x}$$

i is the imaginary unit

Result:

$$-4074.61 + 0i$$

Alternate form:

$$-4074.61$$

$$-4074.61$$

For:

$$e^{-\pi \tau g_{ab} n^a n^b} = e^{\pi \sqrt{58}}$$

$$\tilde{K} = \frac{2^{D/2}}{2} \sqrt{\det(\underline{g})} \frac{\sum_n e^{-\pi \tau g_{ab} n^a n^b}}{(\eta(i\tau))^d},$$

$$(2^5)/2 * \text{sqrt}(\det(-1)) * 1/(1.29927*i)^6 * \text{sum}(e^{(\text{Pi}*\text{sqrt}58)*x}, x=1..1)$$

$$(2^5)/2 * \text{sqrt}((-1)) * 1/(1.29927*i)^6 * \text{sum}(e^{(\text{Pi}*\text{sqrt}58)*x}, x=1..1)$$

Input interpretation:

$$\frac{2^5}{2} \sqrt{-1} \times \frac{1}{(1.29927 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{58} x}$$

i is the imaginary unit

Result:

$$-8.17908 \times 10^{10} i$$

$$-8.17908 * 10^{10} i$$

From the ratio between the two expression, we obtain:

$$\frac{(((2^5)/2 * \text{sqrt}((-1)) * 1/(1.29927*i)^6 * \text{sum}(e^{(\text{Pi}*\text{sqrt}58)*x}, x=1..1)))}{(((1/2 * 1/(1.29927*2i)^6 * \text{sum}(e^{(\text{Pi}*\text{sqrt}22)*x}, x=1..1)))}$$

Input interpretation:

$$\frac{\frac{2^5}{2} \sqrt{-1} \times \frac{1}{(1.29927 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{58} x}}{\frac{1}{2} \times \frac{1}{(1.29927 \times 2 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x}}$$

i is the imaginary unit

Result:

$$2.00733 \times 10^7 i$$

$$16.8149... + \\ 1.5708... i$$

Polar coordinates:

$$r = 16.8881 \text{ (radius)}, \quad \theta = 5.33692^\circ \text{ (angle)}$$

16.8881 result very near to the black hole entropy $\ln(21296876) = 16.8741$

Possible closed forms:

$$\frac{33 i \mathcal{G}_{\text{GS}}}{56} + 13 \zeta(3) - 10 \zeta(5) + \frac{3 \pi^2}{2} - \frac{\pi^4}{30} \approx 16.814899090 + 1.570531370 i$$

$$\frac{14 i}{5 k_r} + 13 \zeta(3) - 10 \zeta(5) + \frac{3 \pi^2}{2} - \frac{\pi^4}{30} \approx 16.814899090 + 1.571079587 i$$

$$\frac{21 i}{11 \mathcal{K}_{-9}^2} + 13 \zeta(3) - 10 \zeta(5) + \frac{3 \pi^2}{2} - \frac{\pi^4}{30} \approx 16.814899090 + 1.570490918 i$$

$\zeta(s)$ is the Riemann zeta function

$$\left(\frac{\ln\left(\left(\frac{2^5}{2} \sqrt{-1} \times \frac{1}{(1.29927i)^6} \sum_{x=1}^1 e^{\pi \sqrt{58} x}\right) \right)}{\left(\frac{1}{2} \times \frac{1}{(1.29927 \times 2i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x}\right)} \right)^{1/6}$$

Input interpretation:

$$\sqrt[6]{\log\left(\frac{\frac{2^5}{2} \sqrt{-1} \times \frac{1}{(1.29927i)^6} \sum_{x=1}^1 e^{\pi \sqrt{58} x}}{\frac{1}{2} \times \frac{1}{(1.29927 \times 2i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x}}\right)}$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

$$1.60156 + 0.0248654 i$$

Result:

$$1.60156... + 0.0248654... i$$

Polar coordinates:

$$r = 1.60175 \text{ (radius)}, \quad \theta = 0.889488^\circ \text{ (angle)}$$

1.60175 result quite near to the value of the golden ratio 1.618033988749...

Possible closed forms:

$$\frac{50}{11} \sqrt{\frac{\bar{s}_{lse}}{7}} + \frac{1}{7} i \left(-e^\pi + 4\pi - \log(8) + 9\log(\pi) + 2\tan^{-1}(\pi) \right) \approx 1.6015498095 + 0.0248657034 i$$

$$\frac{77 C_T^3}{15} + \frac{1}{7} i \left(-e^\pi + 4\pi - \log(8) + 9\log(\pi) + 2\tan^{-1}(\pi) \right) \approx 1.6015447674 + 0.0248657034 i$$

$$\frac{11}{6 \log(\pi)} + \frac{1}{7} i (-e^{\pi} + 4\pi - \log(8) + 9 \log(\pi) + 2 \tan^{-1}(\pi)) \approx$$

$$1.6015422992 + 0.0248657034 i$$

$$\frac{(((\ln[(((2^5)/2 * \sqrt{-1}) * 1/(1.29927*i)^6 * \sum_{x=1}^1 e^{(\pi * \sqrt{58}) * x}, x=1..1)])) / ((1/2 * 1/(1.29927*2i)^6 * \sum_{x=1}^1 e^{(\pi * \sqrt{22}) * x}, x=1..1)]))^{1/6-1})^{1/32}}$$

Input interpretation:

$$\sqrt[32]{\sqrt[6]{\log\left(\frac{\frac{2^5}{2} \sqrt{-1} \times \frac{1}{(1.29927 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{58} x}}{\frac{1}{2} \times \frac{1}{(1.29927 \times 2 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x}}\right)} - 1}}$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

$$0.984269 + 0.00127066 i$$

$$0.984269... +$$

$$0.00127066... i$$

Polar coordinates:

$$r = 0.98427 \text{ (radius), } \theta = 0.073967^\circ \text{ (angle)}$$

0.98427 result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5}} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

and to the Omega mesons ($\omega/\omega_3 \mid 5 + 3 \mid m_{u/d} = 255 - 390 \mid 0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field **0.989117352243 = ϕ**

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs')

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(Blueball Regge trajectories - Harvey Byron Meyer, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Note that

$$\sqrt[32]{\zeta(2) - 1}$$

$$\sqrt[32]{\frac{\pi^2}{6} - 1}$$

$$= 0.9863870313564812915\dots$$

Possible closed forms:

$$\log(-4 - 3e - 2e^2 + 3\pi^2) + \frac{3}{41}i(\bar{V}) \approx 0.984269149788 + 0.001273041896i$$

$$-\frac{B_{\text{Bl}}}{30} + 1 - i e^{-1/e+1/\pi-\pi} \pi^{2-2e} \sec(e\pi) \approx 0.984271278218 + 0.001270660715 i$$

$$\frac{10 \sqrt{\frac{1195}{13}}}{\pi^4} - i e^{-1/e+1/\pi-\pi} \pi^{2-2e} \sec(e\pi) \approx 0.984266685351 + 0.001270660715 i$$

$\log(x)$ is the natural logarithm

$\bar{V}$ is the mean tetrahedron-in-tetrahedron volume

we have also:

$$(((1/2*1/(1.29927*2i))^6*\sum(e^{(\text{Pi}*\text{sqrt}22)*x}, x=1..1)))-21-2/5$$

Input interpretation:

$$\frac{1}{2} \times \frac{1}{(1.29927 \times 2 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x} - 21 - \frac{2}{5}$$

i is the imaginary unit

Result:

$$-4096.01 + 0 i$$

Alternate form:

$$-4096.01$$

$$-4096.01 \approx -4096$$

$$27\text{sqrt}((((1/2*1/(1.29927*2i))^6*\sum(e^{(\text{Pi}*\text{sqrt}22)*x}, x=1..1)))-21-2/5))+i$$

Input interpretation:

$$27 \sqrt{\frac{1}{2} \times \frac{1}{(1.29927 \times 2 i)^6} \sum_{x=1}^1 e^{\pi \sqrt{22} x} - 21 - \frac{2}{5}} + i$$

i is the imaginary unit

Result:

1729. i

1729 i

This result is very near to the mass of candidate glueball **$f_0(1710)$ scalar meson**. Furthermore, 1728 occurs in the algebraic formula for the j -invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

$$((27\sqrt{(((((1/2*1/(1.29927*2i))^6*\sum(e^{(\text{Pi}*sqrt{22})*x}), x=1..1)))}-21-2/5))+i))^{1/15}$$

Input interpretation:

$$\sqrt[15]{27\sqrt{\frac{1}{2}\times\frac{1}{(1.29927\times 2i)^6}\sum_{x=1}^1e^{\pi\sqrt{22}}x-21-\frac{2}{5}+i}}$$

i is the imaginary unit

Result:

1.63481 + 0.171825 i

1.63481... +
0.171825... i

Polar coordinates:

$r = 1.64381$ (radius), $\theta = 5.99998^\circ$ (angle)

$$1.64381 \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934 \dots$$

Possible closed forms:

$$\boxed{\text{root of } 2x^5 - 4x^4 + 2x^3 + 3x^2 - 4x - 5 \text{ near } x = 1.63481} + \frac{17}{55}i\sqrt{\frac{17}{55}} \approx 1.6348098402 + 0.1718420116i$$

$$\boxed{\text{root of } 2x^5 - 4x^4 + 2x^3 + 3x^2 - 4x - 5 \text{ near } x = 1.63481} + \frac{2025i}{121\pi^4} \approx 1.6348098402 + 0.1718067278i$$

$$\boxed{\text{root of } 2x^5 - 4x^4 + 2x^3 + 3x^2 - 4x - 5 \text{ near } x = 1.63481} + \frac{i\sqrt{\frac{23}{2}}}{2\pi^2} \approx 1.6348098402 + 0.1717984254i$$

$$((((27\sqrt[32]{\left(\frac{1}{2} \times \frac{1}{(1.29927 \times 2i)^6} \sum_{x=1}^1 e^{\pi\sqrt{22}} x - 21 - \frac{2}{5} + i - 1\right)}))^{1/15-1}))^{1/32}$$

Input interpretation:

$$\sqrt[32]{\sqrt[15]{27\sqrt{\frac{1}{2} \times \frac{1}{(1.29927 \times 2i)^6} \sum_{x=1}^1 e^{\pi\sqrt{22}} x - 21 - \frac{2}{5} + i - 1}}}$$

i is the imaginary unit

Result:

$$0.986956 + 0.008153i$$

$$0.986956... + 0.008153i$$

Polar coordinates:

$$r = 0.98699 \text{ (radius)}, \quad \theta = 0.473296^\circ \text{ (angle)}$$

0.98699 result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5}} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

and to the Omega mesons ($\omega/\omega_3 \mid 5 + 3 \mid m_{u/d} = 255 - 390 \mid 0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field **0.989117352243 = ϕ**

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs')

A_1^{**}		0.943(39) [2.5]		0.988(38)		0.152(53)
A_4		1.03(10) [2.5]		0.999(32)		0.035(21)

(**Glueball Regge trajectories** - *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Note that

$$\sqrt[32]{\zeta(2) - 1}$$

$$\sqrt[32]{\frac{\pi^2}{6} - 1}$$

$$= 0.9863870313564812915\dots$$

Possible closed forms:

$$\pi \left[\text{root of } 5x^5 + 2x^3 + 5x^2 - 5x + 1 \text{ near } x = 0.314157 \right] + \frac{5i\alpha_0^3}{18} \approx 0.9869525482931879 + 0.0081512750481499i$$

$$\pi \left[\text{root of } 5x^5 + 2x^3 + 5x^2 - 5x + 1 \text{ near } x = 0.314157 \right] + \frac{98i\Lambda^3}{15} \approx 0.9869525482931879 + 0.0081512526139614i$$

$$\pi \left[\text{root of } 5x^5 + 2x^3 + 5x^2 - 5x + 1 \text{ near } x = 0.314157 \right] + \frac{9i}{6125 \mathcal{P}_c(\text{BCC bond})} \approx 0.9869525482931879 + 0.0081496825019525i$$

α_0 is the Littlewood-Salem-Izumi constant

From:

$$T = \frac{\sum_{m,n} q^{|Xm_1 - m_2 - \bar{Y}(n_1 + Xn_2)|^2 / 4 \text{Im}(X) \text{Im}(Y)} \bar{q}^{|Xm_1 - m_2 - Y(n_1 + Xn_2)|^2 / 4 \text{Im}(X) \text{Im}(Y)}}{(\eta(q)\eta(\bar{q}))^2} \quad (3.14)$$

$$T = \frac{\sum_{m,n} q^{|Xm_1 - m_2 - \bar{Y}(n_1 + Xn_2)|^2 / 4 \text{Im}(X) \text{Im}(Y)} \bar{q}^{|Xm_1 - m_2 - Y(n_1 + Xn_2)|^2 / 4 \text{Im}(X) \text{Im}(Y)}}{(\eta(q)\eta(\bar{q}))^2}$$

$$X=Y=i \quad \text{and} \quad X=Y=\exp(i\pi/3).$$

$$q = e^\pi$$

$$(e^{\pi})^{((((\exp((i\pi)/3))^4 - 2 - \exp((i\pi)/3) * (8 + \exp((i\pi)/3) * 16))))^2 / (((4 * i * \exp((i\pi)/3) * i * \exp((i\pi)/3))))}$$

Input:

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) \times 4 - 2 - \exp\left(\frac{i\pi}{3}\right) \left(8 + \exp\left(\frac{i\pi}{3}\right) \times 16\right)\right)^2 / \left(4i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right)\right)}$$

i is the imaginary unit

Exact result:

$$e^{-\frac{1}{4}} e^{-(2i\pi)/3} (-2 + 4e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16e^{(i\pi)/3}))^2 \pi$$

Decimal approximation:

$$-2.58168661638702204336847728116756336291088481082961431707... \\ \times 10^{-8} - \\ 1.77460187318182778016445298539926637253834328011067236932... \times 10^{-8} i$$

(using the principal branch of the logarithm for complex exponentiation)

Property:

$$\exp\left(-\frac{1}{4} e^{-(2i\pi)/3} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)$$

is a transcendental number

Polar coordinates:

$$r \approx 3.13278 \times 10^{-8} \text{ (radius), } \theta \approx -145.496^\circ \text{ (angle)}$$

$$3.13278 \times 10^{-8}$$

Alternate forms:

$$e^{1/2(-11-91i\sqrt{3})\pi}$$

$$e^{-e^{-(2i\pi)/3} (1+2 e^{(i\pi)/3} (1+4 e^{(i\pi)/3}))^2 \pi}$$

$$e^{\frac{1}{4} \sqrt[3]{-1} \left(-2+4 \sqrt[3]{-1}-\sqrt[3]{-1} \left(8+16 \sqrt[3]{-1}\right)\right)^2 \pi}$$

Multivalued result:**General form**

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4-2-\exp\left(\frac{i\pi}{3}\right) \left(8+\exp\left(\frac{i\pi}{3}\right) 16\right)\right)^2 / \left(4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right)\right)} = \\ e^{91 \sqrt{3} \pi n-11 i \pi n-91/2 i \sqrt{3} \pi-(11 \pi)/2} \text{ for } n \in \mathbb{Z}$$

(the choice of n is determined by the branch of the logarithm used for complex exponentiation)

Values

n	-2	-1	0	1	2
value	$e^{(-11/2+22i)\pi-(182+(91i)/2)\sqrt{3}\pi}$	$e^{(-11/2+11i)\pi-(91+(91i)/2)\sqrt{3}\pi}$	$e^{-(11\pi)/2-91/2i\sqrt{3}\pi}$	$e^{(-11/2-11i)\pi+(91-(91i)/2)\sqrt{3}\pi}$	$e^{(-11/2-22i)\pi+(182-(91i)/2)\sqrt{3}\pi}$

$\mathbb{Z}$ is the set of integers

Alternative representations:

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} = \\ (z^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} \text{ for } z = e$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} = \\ (w^a)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} \text{ for } a = \frac{\pi}{\log(w)}$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} = \\ \left(1 + \frac{2}{-1 + \coth\left(\frac{\pi}{2}\right)}\right)^{\left(-2+4\exp\left(\frac{i\pi}{3}\right)-\exp\left(\frac{i\pi}{3}\right)\left(8+16\exp\left(\frac{i\pi}{3}\right)\right)\right)^2/\left(4i^2\exp^2\left(\frac{i\pi}{3}\right)\right)}$$

Series representations:

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} = \\ \exp\left(-4e^{-8/3i\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right) \\ \left(1 + 2e^{4/3i\sum_{k=0}^{\infty}(-1)^k/(1+2k)} + 8e^{8/3i\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)^2 \sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} =$$

$$\left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{-\pi\left(\sum_{k=0}^{\infty} 1/k!\right)^{-(2i\pi)/3}\left(1+2\left(\sum_{k=0}^{\infty} 1/k!\right)^{(i\pi)/3}+8\left(\sum_{k=0}^{\infty} 1/k!\right)^{(2i\pi)/3}\right)^2}$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)} =$$

$$\left(\frac{1}{\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}}\right)^{-\pi\left(1+2\left(1/\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{(i\pi)/3}+8\left(1/\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{(2i\pi)/3}\right)^2\left(1/\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{-(2i\pi)/3}}$$

$$e^{(-1/4 e^{-(2i\pi)/3}(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}(8+16e^{(i\pi)/3}))^2\pi*(e^{\pi i})^{[(((\exp((i*\pi)/3)*4-2-\exp((i*\pi)/3)*(8+\exp((i*\pi)/3)*16))))^2/((4*i*\exp((i*\pi)/3)*i*\exp((i*\pi)/3)))]}$$

Input:

$$\exp\left(-\frac{1}{4} e^{-1/3(2i\pi)}\left(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}\left(8+16e^{(i\pi)/3}\right)\right)^2\pi\right)$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right)\times 4-2-\exp\left(\frac{i\pi}{3}\right)\left(8+\exp\left(\frac{i\pi}{3}\right)\times 16\right)\right)^2/\left(4i\exp\left(\frac{i\pi}{3}\right)i\exp\left(\frac{i\pi}{3}\right)\right)}$$

i is the imaginary unit

Exact result:

$$e^{-\frac{1}{2} e^{-(2i\pi)/3}\left(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}\left(8+16e^{(i\pi)/3}\right)\right)^2\pi}$$

Decimal approximation:

$$3.51589397693141874755292239477435372657584501739703912279\dots$$

$$\times 10^{-16} +$$

$$9.16293181081772831518383384540967171466269999177793201661\dots$$

$$\times 10^{-16} i$$

(using the principal branch of the logarithm for complex exponentiation)

Property:

$$\exp\left(-\frac{1}{2} e^{-(2i\pi)/3} \left(-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3})^2 \pi\right)\right)$$

is a transcendental number

Polar coordinates:

$$r \approx 9.81432 \times 10^{-16} \text{ (radius), } \theta \approx 69.0078^\circ \text{ (angle)}$$

$$9.81432 \times 10^{-16}$$

Alternate forms:

$$e^{(-11-91i\sqrt{3})\pi}$$

$$e^{-11\pi} \cos(91\sqrt{3}\pi) - i e^{-11\pi} \sin(91\sqrt{3}\pi)$$

$$e^{-2e^{-(2i\pi)/3} (1+2e^{(i\pi)/3} (1+4e^{(i\pi)/3})^2 \pi}$$

Alternative representations:

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) \left(-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3})^2 \pi\right)\right)$$

$$(e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} =$$

$$w^a (w^a)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))}$$

$$\text{for } \left(a = \frac{\pi}{\log(w)} \text{ and } a = \frac{(-11 - 91i\sqrt{3})\pi}{2 \log(w)}\right)$$

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \\ (e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} = \\ z^{1/4 e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi} \\ (z^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} \text{ for } z = e$$

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \\ (e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} = \\ \left(1 + \frac{2}{-1 + \coth\left(-\frac{\pi e^{-2i\pi/3} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2}{2 \times 4}\right)}\right) \\ \left(1 + \frac{2}{-1 + \coth\left(\frac{\pi}{2}\right)}\right)^{\left(-2 + 4 \exp\left(\frac{i\pi}{3}\right) - \exp\left(\frac{i\pi}{3}\right) (8 + 16 \exp\left(\frac{i\pi}{3}\right))\right)^2 / (4 i^2 \exp^2\left(\frac{i\pi}{3}\right))}$$

Series representations:

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \\ (e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} = \\ \exp\left(-8 e^{-8/3 i \sum_{k=0}^{\infty} (-1)^k / (1+2k)}\right) \\ \left(1 + 2 e^{4/3 i \sum_{k=0}^{\infty} (-1)^k / (1+2k)} + 8 e^{8/3 i \sum_{k=0}^{\infty} (-1)^k / (1+2k)}\right)^2 \sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}$$

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \\ (e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} = \\ \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{-2\pi \left(\sum_{k=0}^{\infty} 1/k!\right)^{-2i\pi/3} (1+2 \left(\sum_{k=0}^{\infty} 1/k!\right)^{i\pi/3} + 8 \left(\sum_{k=0}^{\infty} 1/k!\right)^{2i\pi/3})^2}$$

$$\exp\left(\frac{1}{4} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \\ (e^\pi)^{\left(\exp\left(\frac{i\pi}{3}\right) 4 - 2 - \exp\left(\frac{i\pi}{3}\right) (8 + \exp\left(\frac{i\pi}{3}\right) 16)\right)^2 / (4 i \exp\left(\frac{i\pi}{3}\right) i \exp\left(\frac{i\pi}{3}\right))} = \\ \left(\frac{1}{\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}}\right)^{-2\pi \left(1 + 2 \left(1 / \left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{(i\pi)/3} + 8 \left(1 / \left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{(2i\pi)/3}\right)^2 \left(1 / \left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)\right)^{(2i\pi)/3}}$$

$$\exp(-1/2 e^{-(2i\pi)/3} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi) * \\ 1/(((1.29927 * e^{(\pi)} * 1.29927 * e^{(\pi)})))^2$$

Input interpretation:

$$\exp\left(-\frac{1}{2} e^{-1/3(2i\pi)} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \times \\ \frac{1}{(1.29927 e^\pi \times 1.29927 e^\pi)^2}$$

i is the imaginary unit

Result:

$$4.30262... \times 10^{-22} + \\ 1.12132... \times 10^{-21} i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 1.20104 \times 10^{-21} \text{ (radius), } \theta = 69.0078^\circ \text{ (angle)}$$

$$1.20104 * 10^{-21}$$

Alternative representations:

$$\frac{\exp\left(\frac{1}{2} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2} = \\ \frac{\exp\left(\frac{1}{2} w^a (-1) (-2 + 4 w^a - w^a (8 + 16 w^a))^2 \pi\right)}{(1.29927 w^a 1.29927 w^a)^2} \\ \text{for } \left(a = \frac{i\pi}{3 \log(w)} \text{ and } a = -\frac{2i\pi}{3 \log(w)} \text{ and } a = \frac{\pi}{\log(w)}\right)$$

$$\frac{\exp\left(\frac{1}{2} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2} =$$

$$\frac{\exp\left(\frac{1}{2} z^{-1/3(2i\pi)} (-1) (-2 + 4 z^{(i\pi)/3} - z^{(i\pi)/3} (8 + 16 z^{(i\pi)/3}))^2 \pi\right)}{(1.29927 z^\pi 1.29927 z^\pi)^2} \text{ for } z = e$$

$$\frac{\exp\left(\frac{1}{2} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2} =$$

$$\exp\left(-\frac{1}{2} \pi \left(1 + \frac{2}{-1 + \coth\left(-\frac{i\pi}{3}\right)}\right)\right)$$

$$\left(-2 + 4 \left(1 + \frac{2}{-1 + \coth\left(\frac{i\pi}{6}\right)}\right) - \left(1 + \frac{2}{-1 + \coth\left(\frac{i\pi}{6}\right)}\right)\right)$$

$$\left(8 + 16 \left(1 + \frac{2}{-1 + \coth\left(\frac{i\pi}{6}\right)}\right)\right)\right)^2 \bigg/ \left(1.6881 \left(1 + \frac{2}{-1 + \coth\left(\frac{\pi}{2}\right)}\right)\right)^2$$

Series representations:

$$\frac{\exp\left(\frac{1}{2} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2} =$$

$$0.350915 \exp\left(-2\pi \left(\sum_{k=0}^{\infty} \frac{\left(\frac{2}{3}\right)^k (-i\pi)^k}{k!}\right) \left(1 + 2 \sum_{k=0}^{\infty} \frac{3^{-k} (i\pi)^k}{k!} + 8 \left(\sum_{k=0}^{\infty} \frac{3^{-k} (i\pi)^k}{k!}\right)^2\right)\right)$$

$$\sum_{k=0}^{\infty} \frac{4^k (-\pi)^k}{k!}$$

$$\frac{\exp\left(\frac{1}{2} e^{-1/3(2i\pi)} (-1) (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2} =$$

$$0.350915 \exp\left(-2\pi \left(\sum_{k=-\infty}^{\infty} I_k\left(-\frac{2i\pi}{3}\right)\right) \left(1 + 2 \sum_{k=-\infty}^{\infty} I_k\left(\frac{i\pi}{3}\right) + 8 \left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{i\pi}{3}\right)\right)^2\right)\right)$$

$$\sum_{k=-\infty}^{\infty} I_k(-4\pi)$$

$$\frac{\exp\left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2 + 4 e^{(i \pi)/3} - e^{(i \pi)/3} (8 + 16 e^{(i \pi)/3})^2 \pi\right)}{(1.29927 e^{\pi} 1.29927 e^{\pi})^2} =$$

$$0.350915 \exp\left(-2 \pi \left(1 + 2 \sum_{k=-\infty}^{\infty} (-1)^k I_k\left(-\frac{i \pi}{3}\right) + 8 \left(\sum_{k=-\infty}^{\infty} (-1)^k I_k\left(-\frac{i \pi}{3}\right)\right)^2\right)\right)$$

$$\sum_{k=-\infty}^{\infty} (-1)^k I_k\left(\frac{2 i \pi}{3}\right) \sum_{k=-\infty}^{\infty} (-1)^k I_k(4 \pi)$$

$$(26*3)/ ((\ln(((\exp(-1/2 e^{-(2 i \pi)/3}) (-2 + 4 e^{((i \pi)/3}) - e^{((i \pi)/3}) (8 + 16 e^{((i \pi)/3}))^2 \pi) * 1/(((1.29927*e^{(Pi)}*1.29927*e^{(Pi)}))^2))))))$$

Input interpretation:

$$(26 \times 3) / \log\left(\frac{\exp\left(-\frac{1}{2} e^{-1/3 (2 i \pi)} (-2 + 4 e^{(i \pi)/3} - e^{(i \pi)/3} (8 + 16 e^{(i \pi)/3})^2 \pi\right)}{1}\right)}{(1.29927 e^{\pi} \times 1.29927 e^{\pi})^2}\right)$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

$$-1.618217... - 0.04045996... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 1.61872 \text{ (radius), } \theta = -178.568^\circ \text{ (angle)}$$

1.61872 result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2}\right)} =$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} w^a (-1) (-2+4 w^a - w^a (8+16 w^a))^2 \pi\right)}{(1.29927 w^a 1.29927 w^a)^2}\right)}$$

for $\left(a = \frac{i \pi}{3 \log(w)} \text{ and } a = -\frac{2 i \pi}{3 \log(w)} \text{ and } a = \frac{\pi}{\log(w)}\right)$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2}\right)} =$$

$$\frac{78}{\log_e\left(\frac{\exp\left(-\frac{1}{2} \pi e^{-(2 i \pi)/3} (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2\right)}{(1.6881 (e^\pi)^2)^2}\right)}$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2}\right)} =$$

$$\frac{78}{\log(a) \log_a\left(\frac{\exp\left(-\frac{1}{2} \pi e^{-(2 i \pi)/3} (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2\right)}{(1.6881 (e^\pi)^2)^2}\right)}$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2+4 e^{(i \pi)/3} - e^{(i \pi)/3} (8+16 e^{(i \pi)/3})^2 \pi\right)}{(1.29927 e^\pi 1.29927 e^\pi)^2}\right)} =$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2} z^{-1/3 (2 i \pi)} (-1) (-2+4 z^{(i \pi)/3} - z^{(i \pi)/3} (8+16 z^{(i \pi)/3})^2 \pi\right)}{(1.29927 z^\pi 1.29927 z^\pi)^2}\right)} \text{ for } z = e$$

Series representations:

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2}e^{-1/3}(2i\pi)\right)(-1)(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}(8+16e^{(i\pi)/3})^2\pi)}{(1.29927e^\pi 1.29927e^\pi)^2}\right)} =$$

$$78 / \log\left(0.350915 \exp\left(-2\pi \left(\sum_{k=0}^{\infty} \frac{\left(\frac{2}{3}\right)^k (-i\pi)^k}{k!}\right)\right.\right.$$

$$\left.\left(1 + 2 \sum_{k=0}^{\infty} \frac{3^{-k} (i\pi)^k}{k!} + 8 \left(\sum_{k=0}^{\infty} \frac{3^{-k} (i\pi)^k}{k!}\right)^2\right)^2\right) \sum_{k=0}^{\infty} \frac{4^k (-\pi)^k}{k!}\right)$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2}e^{-1/3}(2i\pi)\right)(-1)(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}(8+16e^{(i\pi)/3})^2\pi)}{(1.29927e^\pi 1.29927e^\pi)^2}\right)} =$$

$$78 / \log\left(0.350915 \exp\left(-2\pi \left(\sum_{k=-\infty}^{\infty} I_k\left(-\frac{2i\pi}{3}\right)\right)\right.\right.$$

$$\left.\left(1 + 2 \sum_{k=-\infty}^{\infty} I_k\left(\frac{i\pi}{3}\right) + 8 \left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{i\pi}{3}\right)\right)^2\right)^2\right) \sum_{k=-\infty}^{\infty} I_k(-4\pi)\right)$$

$$\frac{26 \times 3}{\log\left(\frac{\exp\left(\frac{1}{2}e^{-1/3}(2i\pi)\right)(-1)(-2+4e^{(i\pi)/3}-e^{(i\pi)/3}(8+16e^{(i\pi)/3})^2\pi)}{(1.29927e^\pi 1.29927e^\pi)^2}\right)} =$$

$$78 / \left(2\pi \mathcal{A}\left[\frac{1}{2\pi} \arg(-x + 0.350915 e^{-4\pi}\right.\right.$$

$$\left.\left.\exp(-2e^{-(2i\pi)/3}(1 + 2e^{(i\pi)/3} + 8e^{(2i\pi)/3})^2\pi)\right)\right] +$$

$$\log(x) - \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k x^{-k} (-x + 0.350915 e^{-4\pi}$$

$$\exp(-2e^{-(2i\pi)/3}(1 + 2e^{(i\pi)/3} + 8e^{(2i\pi)/3})^2\pi))^k \Bigg) \text{ for } x < 0$$

Integral representation:

$$\frac{26 \times 3}{\log \left(\frac{\exp \left(\frac{1}{2} e^{-1/3 (2 i \pi)} (-1) (-2 + 4 e^{(i \pi)/3} - e^{(i \pi)/3} (8 + 16 e^{(i \pi)/3})^2 \pi) \right)}{(1.29927 e^{\pi} 1.29927 e^{\pi})^2} \right)} = \frac{1}{\int_1^{0.350915 e^{-4 \pi} \exp(-2 e^{-(2 i \pi)/3} (1 + 2 e^{(i \pi)/3} + 8 e^{(2 i \pi)/3})^2 \pi)} \frac{1}{t} dt}$$

From:

$$K = \frac{1}{2} \frac{\sum_m e^{-\pi \tau |X| m_1 - m_2|^2 / \text{Im}(X) \text{Im}(Y)}}{(\eta(2i\tau))^2}.$$

$$\frac{1}{2} e^{[(((((-\text{Pi}(\exp((i*\text{Pi})/3)*4-2)))^2 / (((i*\exp((i*\text{Pi})/3)*i*\exp((i*\text{Pi})/3)))))]}$$

$$1/((1.29927*2i)^2)$$

Input interpretation:

$$\frac{1}{2} \exp \left(\frac{(-\pi (\exp(\frac{i\pi}{3}) \times 4 - 2))^2}{i \exp(\frac{i\pi}{3}) i \exp(\frac{i\pi}{3})} \right) \times \frac{1}{(1.29927 \times 2 i)^2}$$

i is the imaginary unit

Result:

$$6.37276... \times 10^{-28} +$$

$$1.26653... \times 10^{-27} i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 1.41783 \times 10^{-27}$ (radius), $\theta = 63.2901^\circ$ (angle)

1.41783×10^{-27}

Alternative representations:

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2 2} = \frac{w^a}{(1.29927 \times 2i)^2 2} \text{ for } a = -\frac{12\sqrt[3]{-1}\pi^2}{\log(w)}$$

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2 2} = \frac{1 + \frac{2}{-1 + \coth\left(\frac{(-\pi(-2+4\exp(\frac{i\pi}{3}))^2}{2(i^2 \exp^2(\frac{i\pi}{3}))}\right)}}{2(2.59854i)^2}$$

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2 2} = \frac{z^{(-\pi(\exp(\frac{i\pi}{3})4-2))^2/(i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3}))}}{(1.29927 \times 2i)^2 2} \text{ for } z = e$$

Series representations:

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2 2} = \frac{0.0740476 \sum_{k=-\infty}^{\infty} I_k \left(\frac{\pi^2 (2-4\exp(\frac{i\pi}{3}))^2}{i^2 \exp^2(\frac{i\pi}{3})} \right)}{i^2}$$

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2 2} = \frac{0.0740476 \sum_{k=-\infty}^{\infty} (-1)^k I_k \left(-\frac{4\pi^2 (1-2\exp(\frac{i\pi}{3}))^2}{i^2 \exp^2(\frac{i\pi}{3})} \right)}{i^2}$$

$$\frac{\exp\left(\frac{(-\pi(\exp(\frac{i\pi}{3})4-2))^2}{i\exp(\frac{i\pi}{3})i\exp(\frac{i\pi}{3})}\right)}{(1.29927 \times 2i)^2} = \frac{0.0740476 \sum_{k=0}^{\infty} \frac{\left(\frac{\pi^2 (2-4\exp(\frac{i\pi}{3}))^2}{i^2 \exp^2(\frac{i\pi}{3})}\right)^k}{k!}}{i^2}$$

$I_n(z)$ is the modified Bessel function of the first kind

$n!$ is the factorial function

Dividing the two results, we obtain:

$$\frac{((\exp(-1/2 e^{-(2i\pi)/3})(-2+4e^{(i\pi)/3}) - e^{(i\pi)/3}(8+16e^{(i\pi)/3}))^2 \pi)}{1/(((1.29927 * e^{(i\pi)/3}) * 1.29927 * e^{(i\pi)/3}))^2)} \times \frac{1}{(6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i)}$$

Input interpretation:

$$\left(\exp\left(-\frac{1}{2} e^{-1/3(2i\pi)} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \times \frac{1}{(1.29927 e^{\pi} \times 1.29927 e^{\pi})^2} \right) \times \frac{1}{6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i}$$

i is the imaginary unit

Result:

$$8.42887... \times 10^5 + 84395.8... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 847101. \text{ (radius), } \theta = 5.7178^\circ \text{ (angle)}$$

$$847101$$

From which, after some calculations:

$$728 + \frac{1}{(4 + \frac{1}{\pi})} \left(\exp\left(-\frac{1}{2} e^{-(2i\pi)/3} (-2 + 4e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16e^{(i\pi)/3}))^2 \pi \right) \times \frac{1}{((1.29927 * e^{\pi}) * 1.29927 * e^{\pi}))^2} \right) \times \frac{1}{(6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i) - 2\pi}$$

$$728 = 9^3 - 1 \text{ (Ramanujan taxicab number)}$$

Input interpretation:

$$728 + \frac{1}{4 + \frac{1}{\pi}} \left(\exp\left(-\frac{1}{2} e^{-1/3(2i\pi)} (-2 + 4e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16e^{(i\pi)/3}))^2 \pi \right) \times \frac{1}{(1.29927 e^{\pi} \times 1.29927 e^{\pi})^2} \right) \times \frac{1}{6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i} - 2\pi$$

i is the imaginary unit

Result:

$$1.95911... \times 10^5 + 19543.7... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 196883. \text{ (radius), } \theta = 5.69688^\circ \text{ (angle)}$$

$$196883$$

196884/196883 is a fundamental number of the following j -invariant

$$j(\tau) = q^{-1} + 744 + 196884q + 21493760q^2 + 864299970q^3 + 20245856256q^4 + \dots$$

(In mathematics, Felix Klein's j -invariant or j function, regarded as a function of a complex variable τ , is a modular function of weight zero for $SL(2, \mathbb{Z})$ defined on the upper half plane of complex numbers. Several remarkable properties of j have to do with its q expansion (Fourier series expansion), written as a Laurent series in terms of $q = e^{2\pi i \tau}$ (the square of the nome), which begins:

$$j(\tau) = q^{-1} + 744 + 196884q + 21493760q^2 + 864299970q^3 + 20245856256q^4 + \dots$$

Note that j has a simple pole at the cusp, so its q -expansion has no terms below q^{-1} .

All the Fourier coefficients are integers, which results in several almost integers, notably Ramanujan's constant:

$$e^{\pi\sqrt{163}} \approx 640320^3 + 744.$$

The asymptotic formula for the coefficient of q^n is given by

$$\frac{e^{4\pi\sqrt{n}}}{\sqrt{2}n^{3/4}},$$

as can be proved by the Hardy–Littlewood circle method)

and:

$$(2*11)/\ln[(((\exp(-1/2 e^{-(2 i \pi)/3})(-2+4e^{(i \pi)/3}) - e^{(i \pi)/3})(8+16 e^{(i \pi)/3})))^2\pi) \\ 1/(((1.29927*e^{(Pi)}*1.29927*e^{(Pi)}))^2))*1/(6.37276\times 10^{-28} + 1.26653\times 10^{-27} \\ i)]$$

Input interpretation:

$$(2 \times 11) \Big/ \log \left(\left(\exp \left(-\frac{1}{2} e^{-1/3(2 i \pi)} (-2 + 4 e^{(i \pi)/3} - e^{(i \pi)/3} (8 + 16 e^{(i \pi)/3}))^2 \pi \right) \times \right. \right. \\ \left. \left. \frac{1}{(1.29927 e^{\pi} \times 1.29927 e^{\pi})^2} \right) \times \frac{1}{6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i} \right)$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

$$1.61169... - \\ 0.0117833... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 1.61173 \text{ (radius)}, \quad \theta = -0.418892^\circ \text{ (angle)}$$

1.61173 result that is a very good approximation to the value of the golden ratio
1.618033988749...

Furthermore, from

$$\left(\exp\left(-\frac{1}{2} e^{-1/3(2i\pi)} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \times \frac{1}{(1.29927 e^\pi \times 1.29927 e^\pi)^2} \right) \times \frac{1}{6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i}$$

we obtain also:

$$((1/(2*e))) * (((\exp(-1/2 e^{-(2 i \pi)/3}) (-2 + 4 e^{(i \pi)/3} - e^{(i \pi)/3} (8 + 16 e^{(i \pi)/3}))^2 \pi) \times 1/(((1.29927 * e^{(\pi)}) * 1.29927 * e^{(\pi)}))^2) * 1/(6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i))) - 64^2 - (64 * 16) + (64 + 16)$$

Input interpretation:

$$\frac{1}{2e} \left(\left(\exp\left(-\frac{1}{2} e^{-1/3(2i\pi)} (-2 + 4 e^{(i\pi)/3} - e^{(i\pi)/3} (8 + 16 e^{(i\pi)/3}))^2 \pi\right) \times \frac{1}{(1.29927 e^\pi \times 1.29927 e^\pi)^2} \right) \times \frac{1}{6.37276 \times 10^{-28} + 1.26653 \times 10^{-27} i} \right) - 64^2 - 64 \times 16 + (64 + 16)$$

i is the imaginary unit

Result:

$$1.50000... \times 10^5 + 15523.7... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 150801. \text{ (radius), } \theta = 5.90858^\circ \text{ (angle)}$$

150801 result very near to the total sum of Planck multipole spectrum data
150802.7363

For:

$$R = \sqrt{2}, \quad B_{ab} = 0, \pm 1.$$

$m = 6$; $\eta(\tau) = 1.29927$; $N = 4$, $m = 4, 2$ $n = 8, 16$; $r = 5$; $\epsilon = 1/24$; $D = 10$ and $d = 6$

$$r = N + 1, \dots, M + N$$

$$\tilde{A} = \frac{N^2 2^{-D/2 - 2d + r}}{2} \sqrt{\det(g)} \frac{\sum_n \sum_{\{\epsilon^a = 0, 1\}} e^{-(\pi\tau/4)g_{ab}n^a n^b + i\pi\epsilon^a B_{ab}n^b}}{\eta(i\tau)^d}, \quad (3.7)$$

$$16 \times 2^{(-5-12+5)} \times \frac{1}{2} \sqrt{-1} \times \frac{1}{i \times 1.29927} \times e^{-\left(\left(\frac{\pi}{4}\right)(-16 \times 8) + i \pi \times \frac{1}{24} \times 16\right)}$$

Input interpretation:

$$16 \times 2^{-5-12+5} \times \frac{1}{2} \sqrt{-1} \times \frac{1}{i \times 1.29927} \exp\left(-\left(\frac{\pi}{4}(-16 \times 8) + i \pi \times \frac{1}{24} \times 16\right)\right)$$

i is the imaginary unit

Result:

$$-3.43593... \times 10^{40} - 5.95120... \times 10^{40} i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 6.87185 \times 10^{40} \text{ (radius), } \theta = -120^\circ \text{ (angle)}$$

$$6.87185 \times 10^{40}$$

Series representations:

$$\frac{(16 \times 2^{-5-12+5}) \sqrt{-1} e^{-(1/4 \pi (-16 \times 8) + (i \pi 16)/24)}}{2 (i 1.29927)} = \frac{0.00150325 e^{-2/3 (-48+i) \pi} \sqrt{-2} \sum_{k=0}^{\infty} (-2)^{-k} \binom{\frac{1}{2}}{k}}{i}$$

$$\frac{(16 \times 2^{-5-12+5}) \sqrt{-1} e^{-(1/4 \pi (-16 \times 8) + (i \pi 16)/24)}}{2 (i 1.29927)} = \frac{0.00150325 e^{-2/3 (-48+i) \pi} \sqrt{-2} \sum_{k=0}^{\infty} \frac{2^{-k} \left(-\frac{1}{2}\right)_k}{k!}}{i}$$

$$\frac{(16 \times 2^{-5-12+5}) \sqrt{-1} e^{-(1/4 \pi (-16 \times 8) + (i \pi 16)/24)}}{2 (i 1.29927)} = \frac{0.000751624 e^{-2/3 (-48+i) \pi} \sum_{j=0}^{\infty} \text{Res}_{s=-\frac{1}{2}+j} (-2)^{-s} \Gamma\left(-\frac{1}{2} - s\right) \Gamma(s)}{i \sqrt{\pi}}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

$\Gamma(x)$ is the gamma function

$\text{Res}_{z=z_0} f$ is a complex residue

For:

$$R = \sqrt{2}, \quad B_{ab} = 0, \pm 1. \quad r = N + 1, \dots, M + N$$

$m = 6$; $\eta(\tau) = 1.29927$; $N = 4$, $m = 4, 2$ $n = 8, 16$; $r = 5$; $\epsilon = 1/24$; $D = 10$ and $d = 6$

From:

$$A = \frac{N^2 - 2^{r-d}}{2} \frac{\sum_m \sum_{\{\epsilon^a=0,1\}} e^{-(\pi\tau/2)g^{ab}(2m_a+B_{ac}\epsilon^c)(2m_b+B_{bd}\epsilon^d)}}{\eta(i\tau/2)^d}, \quad (3.8)$$

$$1/2*16-2^{(5-6)} * (1/(1.29927*i/2))^6 * e^{-(((\pi/2)*-1*(2*4+(1/24))(2*2+1/24)))}$$

Input interpretation:

$$\frac{1}{2} \times 16 - 2^{5-6} \left(\frac{1}{1.29927 \times \frac{i}{2}} \right)^6 \exp \left(- \left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)$$

i is the imaginary unit

Result:

$$9.89131... \times 10^{22}$$

$$9.89131... * 10^{22}$$

Alternative representations:

$$\begin{aligned} \frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(- \frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) = \\ 8 - \frac{1}{2} e^{90^\circ (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i} \right)^6 \end{aligned}$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$8 - \frac{1}{2} e^{-1/2 i \log(-1) (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i} \right)^6$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$8 - \frac{1}{2} e^{i \log \left(\frac{1-i}{1+i} \right) \left(4 + \frac{1}{24} \right) \left(8 + \frac{1}{24} \right)} \left(\frac{1}{0.649635 i} \right)^6$$

Series representations:

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$\frac{6.65202 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k) \right)}{i^6}$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$\frac{6.65202 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k) \right)}{i^6}$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$\frac{6.65202 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721 \times \sum_{k=1}^{\infty} 4^{-k} (-1+3^k) \zeta(1+k)} / 1152 \right)}{i^6}$$

Integral representations:

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$8 - \frac{6.65202 e^{18\,721/576 \times \int_0^\infty 1/(1+t^2) dt}}{i^6}$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$8 - \frac{6.65202 e^{18\,721/288 \int_0^1 \sqrt{1-t^2} dt}}{i^6}$$

$$\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) =$$

$$8 - \frac{6.65202 e^{18\,721/576 \int_0^\infty \sin(t)/t dt}}{i^6}$$

From:

$$\tilde{M} = \frac{2N 2^{-d+r/2}}{-2} \sqrt{\det(g)} \frac{\sum_n \sum_{\{\epsilon^a=0,1\}} e^{-\pi\tau g_{ab} n^a n^b + i\pi\epsilon^a B_{ab} n^b} \gamma_{\{\epsilon^a\}}}{\eta(i\tau + 1/2)^d} \quad (3.9)$$

$$1/2*2*4*2^{(-6+5/2)}*\text{sqrt}(-1)*1/(1.29927*i+1/2)^6*e^{-(((\text{Pi}*(-8*16)+i*\text{Pi}*1/24*16)))}*1/24}$$

Input interpretation:

$$\frac{1}{2} \times 2 \times 4 \times 2^{-6+5/2} \sqrt{-1} \times \frac{1}{\left(1.29927 i + \frac{1}{2}\right)^6} \exp\left(-\left(\pi(-8 \times 16) + i \pi \times \frac{1}{24} \times 16\right)\right) \times \frac{1}{24}$$

i is the imaginary unit

Result:

$$9.68115... \times 10^{170} - \\ 8.78344... \times 10^{171} i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 8.83663 \times 10^{171} \text{ (radius), } \theta = -83.7102^\circ \text{ (angle)}$$

$$8.83663 \times 10^{171}$$

Series representations:

$$\frac{(2 \times 4) 2^{-6+5/2} \left(\sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)}\right)}{2 \left(\left(1.29927 i + \frac{1}{2}\right)^6 24\right)} = \\ \frac{0.0030623 e^{-2/3(-192+i)\pi} \sqrt{-2} \sum_{k=0}^{\infty} (-2)^{-k} \left(\frac{1}{2}\right)_k}{(0.384831 + i)^6}$$

$$\frac{(2 \times 4) 2^{-6+5/2} \left(\sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)}\right)}{2 \left(\left(1.29927 i + \frac{1}{2}\right)^6 24\right)} = \\ \frac{0.0030623 e^{-2/3(-192+i)\pi} \sqrt{-2} \sum_{k=0}^{\infty} \frac{2^{-k} \left(-\frac{1}{2}\right)_k}{k!}}{(0.384831 + i)^6}$$

$$\frac{(2 \times 4) 2^{-6+5/2} (\sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)})}{2 \left((1.29927 i + \frac{1}{2})^6 24 \right)} = \frac{0.00153115 e^{-2/3(-192+i)\pi} \sum_{j=0}^{\infty} \text{Res}_{s=-\frac{1}{2}+j} (-2)^{-s} \Gamma(-\frac{1}{2}-s) \Gamma(s)}{(0.384831 + i)^6 \sqrt{\pi}}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

$\Gamma(x)$ is the gamma function

$\text{Res}_{z=z_0} f$ is a complex residue

$1/245[\ln(((1/2*2*4*2^(-6+5/2)*\text{sqrt}(-1)*1/(1.29927*i+1/2)^6*e^{\wedge}(((\text{Pi}*(-8*16)+i*\text{Pi}*1/24*16))))*1/24)))]$

Input interpretation:

$$\frac{1}{245} \log \left(\frac{1}{2} \times 2 \times 4 \times 2^{-6+5/2} \sqrt{-1} \times \frac{1}{(1.29927 i + \frac{1}{2})^6} \exp \left(- \left(\pi (-8 \times 16) + i \pi \times \frac{1}{24} \times 16 \right) \right) \times \frac{1}{24} \right)$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

1.616004... -
0.005963343... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 1.61601$ (radius), $\theta = -0.211431^\circ$ (angle)

1.61601 result that is a very good approximation to the value of the golden ratio
1.618033988749...

Alternative representations:

$$\frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) =$$

$$\frac{1}{245} \log_e \left(\frac{4 e^{128 \pi - (16 i \pi)/24} \sqrt{-1}}{2^{7/2} \times 24 \left(\frac{1}{2} + 1.29927 i \right)^6} \right)$$

$$\frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) =$$

$$\frac{1}{245} \log(a) \log_a \left(\frac{4 e^{128 \pi - (16 i \pi)/24} \sqrt{-1}}{2^{7/2} \times 24 \left(\frac{1}{2} + 1.29927 i \right)^6} \right)$$

$$\frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) =$$

$$- \frac{1}{245} \text{Li}_1 \left(1 - \frac{4 e^{128 \pi - (16 i \pi)/24} \sqrt{-1}}{2^{7/2} \times 24 \left(\frac{1}{2} + 1.29927 i \right)^6} \right)$$

Series representations:

$$\frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) =$$

$$\frac{1}{245} \log \left(\frac{0.0030623 e^{-2/3(-192+i)\pi} \sqrt{-2} \sum_{k=0}^{\infty} (-2)^{-k} \left(\frac{1}{2} \right)}{(0.384831 + i)^6} \right)$$

$$\begin{aligned} & \frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) = \\ & \frac{1}{245} \log \left(-1 + \frac{0.0030623 e^{-2/3(-192+i) \pi} \sqrt{-1}}{(0.384831 + i)^6} \right) - \\ & \frac{1}{245} \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1 + \frac{0.0030623 e^{-2/3(-192+i) \pi} \sqrt{-1}}{(0.384831 + i)^6} \right)^{-k}}{k} \end{aligned}$$

$$\begin{aligned} & \frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) = \\ & \frac{1}{245} \log \left(-1 + \frac{e^{128 \pi - (2 i \pi)/3} \sqrt{-1}}{48 \sqrt{2} \left(\frac{1}{2} + 1.29927 i \right)^6} \right) - \\ & \frac{1}{245} \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1 + \frac{0.0030623 e^{-2/3(-192+i) \pi} \sqrt{-1}}{(0.384831 + i)^6} \right)^{-k}}{k} \end{aligned}$$

Integral representations:

$$\begin{aligned} & \frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) = \\ & \frac{1}{245} \int_1^{\frac{0.0030623 e^{-2/3(-192+i) \pi} \sqrt{-1}}{(0.384831 + i)^6}} \frac{1}{t} dt \end{aligned}$$

$$\begin{aligned} & \frac{1}{245} \log \left(\frac{2 \times 4 \left(2^{-6+5/2} \sqrt{-1} e^{-(\pi(-8 \times 16) + (i \pi 16)/24)} \right)}{2 \left(\left(1.29927 i + \frac{1}{2} \right)^6 24 \right)} \right) = \\ & \frac{1}{490 \pi \mathcal{A}} \int_{-\mathcal{A} \infty + \gamma}^{\mathcal{A} \infty + \gamma} \frac{\Gamma(-s)^2 \Gamma(1+s) \left(-1 + \frac{e^{128 \pi - (2 i \pi)/3} \sqrt{-1}}{48 \sqrt{2} \left(\frac{1}{2} + 1.29927 i \right)^6} \right)^{-s}}{\Gamma(1-s)} ds \text{ for } -1 < \gamma < 0 \end{aligned}$$

$\Gamma(x)$ is the gamma function

dividing the product of the two previous results 6.87185×10^{40} and $9.89131 \dots \times 10^{22}$ by the following expression

$$\frac{1}{2} \times 2 \times 4 \times 2^{-6+5/2} \sqrt{-1} \times \frac{1}{(1.29927i + \frac{1}{2})^6} \exp\left(-\left(\pi(-8 \times 16) + i\pi \times \frac{1}{24} \times 16\right)\right) \times \frac{1}{24}$$

we obtain:

$$(9.89131e+22 \times 6.87185e+40) / [(((1/2 \times 2 \times 4 \times 2^{-6+5/2}) \times \sqrt{-1}) \times 1 / (1.29927i + 1/2)^6 \times e^{-((\pi \times (-8 \times 16) + i \times \pi \times 1/24 \times 16))}) \times 1/24)]^{1/3}$$

Input interpretation:

$$\frac{9.89131 \times 10^{22} \times 6.87185 \times 10^{40}}{\sqrt[3]{\frac{1}{2} \times 2 \times 4 \times 2^{-6+5/2} \sqrt{-1} \times \frac{1}{(1.29927i + \frac{1}{2})^6} \exp\left(-\left(\pi(-8 \times 16) + i\pi \times \frac{1}{24} \times 16\right)\right) \times \frac{1}{24}}}$$

i is the imaginary unit

Result:

$$2.90551 \dots \times 10^6 + 1.53861 \dots \times 10^6 i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 3.28775 \times 10^6 \text{ (radius), } \theta = 27.9034^\circ \text{ (angle)}$$

$$3.28775 \times 10^6$$

From which:

$$\sqrt[3]{(((9.89131e+22 \times 6.87185e+40) / [(((1/2 \times 2 \times 4 \times 2^{-6+5/2}) \times \sqrt{-1}) \times 1 / (1.29927i + 1/2)^6 \times e^{-((\pi \times (-8 \times 16) + i \times \pi \times 1/24 \times 16))}) \times 1/24)]^{1/3}))}$$

Input interpretation:

$$\sqrt{\frac{9.89131 \times 10^{22} \times 6.87185 \times 10^{40}}{\sqrt[3]{\frac{1}{2} \times 2 \times 4 \times 2^{-6+5/2}} \sqrt{-1} \times \frac{1}{(1.29927i + \frac{1}{2})^6} \exp\left(-\left(\pi(-8 \times 16) + i\pi \times \frac{1}{24} \times 16\right)\right) \times \frac{1}{24}}}$$

i is the imaginary unit**Result:**

$$1759.72... + \\ 437.173... i$$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$$r = 1813.21 \text{ (radius)}, \quad \theta = 13.9517^\circ \text{ (angle)}$$

1813.21 result very near to the value of Planck multipole spectrum data 1819.88

From:

$$M = \frac{N 2^{r/2-d/2}}{2} \frac{\sum_m \sum_{\{\epsilon^a = 0, 1\}} e^{-(\pi\tau/2)g^{ab}(2m_a + B_{ac}\epsilon^c)(2m_b + B_{bd}\epsilon^d)} \gamma_{\{\epsilon^a\}}}{\eta(i\tau/2 + 1/2)^d}, \quad (3.10)$$

$$1/2*4*2^{(5/2-3)}*1/((1.29927*i/2+1/2)^6)*e^{-(((\pi/2)*-(2*4+1/24)(2*2+1/24)))}*1/24$$

Input interpretation:

$$\frac{1}{2} \times 4 \times 2^{5/2-3} \times \frac{1}{(1.29927 \times \frac{i}{2} + \frac{1}{2})^6} \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right) \times \frac{1}{24}$$

i is the imaginary unit**Result:**

$$2.02335... \times 10^{21} + \\ 2.05932... \times 10^{21} i$$

Polar coordinates:

$$r = 2.887 \times 10^{21} \text{ (radius), } \theta = 45.5049^\circ \text{ (angle)}$$

$$2.887 \times 10^{21}$$

Alternative representations:

$$\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2}\right)^6 24} = \frac{2 e^{90^\circ (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}$$

$$\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2}\right)^6 24} = \frac{2 e^{-1/2 i \log(-1) (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}$$

$$\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2}\right)^6 24} = \frac{2 e^{i \log\left(\frac{1-i}{1+i}\right) \left(4+\frac{1}{24}\right) \left(8+\frac{1}{24}\right)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}$$

$\log(x)$ is the natural logarithm

From the ratio between (3.8) and (3.10), we obtain:

$$\frac{(((1/2 \cdot 16 - 2^{(5-6)}) \cdot (1/(1.29927 \cdot i/2))^6 \cdot e^{-((\pi/2) \cdot 1 \cdot (2 \cdot 4 + (1/24))(2 \cdot 2 + 1/24))}))/((1/2 \cdot 4 \cdot 2^{(5/2-3)} \cdot 1/((1.29927 \cdot i/2 + 1/2)^6) \cdot e^{-((\pi/2) \cdot (2 \cdot 4 + 1/24)(2 \cdot 2 + 1/24)) \cdot 1/24}))}{1}$$

Input interpretation:

$$\frac{\frac{1}{2} \times 16 - 2^{5-6} \left(\frac{1}{1.29927 \times \frac{i}{2}} \right)^6 \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{1}{2} \times 4 \times 2^{5/2-3} \times \frac{1}{\left(1.29927 \times \frac{i}{2} + \frac{1}{2}\right)^6} \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right) \times \frac{1}{24}}$$

i is the imaginary unit

Result:

24.0122... -
24.4391... i

Polar coordinates:

$r = 34.2616$ (radius), $\theta = -45.5049^\circ$ (angle)

34.2616

Alternative representations:

$$\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp\left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2}\right)^6 24}} =$$

$$\frac{8 - \frac{1}{2} e^{90^\circ (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i} \right)^6}{\frac{2 e^{90^\circ (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}}$$

$$\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp\left(-\frac{1}{2}(-1)\left(\pi\left(2 \times 4 + \frac{1}{24}\right)\left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2}\left(\pi(-1)\left(2 \times 4 + \frac{1}{24}\right)\left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927i}{2} + \frac{1}{2}\right)^6 24}} =$$

$$8 - \frac{\frac{1}{2} e^{-1/2 i \log(-1) (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i}\right)^6}{\frac{2 e^{-1/2 i \log(-1) (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}}$$

$$\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp\left(-\frac{1}{2}(-1)\left(\pi\left(2 \times 4 + \frac{1}{24}\right)\left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2}\left(\pi(-1)\left(2 \times 4 + \frac{1}{24}\right)\left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{2 \left(\frac{1.29927i}{2} + \frac{1}{2}\right)^6 24}} =$$

$$8 - \frac{\frac{1}{2} e^{i \log\left(\frac{1-i}{1+i}\right) \left(4 + \frac{1}{24}\right) \left(8 + \frac{1}{24}\right)} \left(\frac{1}{0.649635 i}\right)^6}{\frac{2 e^{i \log\left(\frac{1-i}{1+i}\right) \left(4 + \frac{1}{24}\right) \left(8 + \frac{1}{24}\right)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i\right)^6}}$$

$\log(x)$ is the natural logarithm

From which:

$$(64-8)/[(((1/2*16-2^{(5-6)}) * (1/(1.29927*i/2))^6 * e^{-(((\pi/2)*-1*(2*4+(1/24))(2*2+1/24)))))/(((1/2*4*2^{(5/2-3)}*1/((1.29927*i/2+1/2)^6)*e^{-(((\pi/2)*-(2*4+1/24)(2*2+1/24)))*1/24}))]$$

Input interpretation:

$$\frac{64 - 8}{\frac{\frac{1}{2} \times 16 - 2^{5-6} \left(\frac{1}{1.29927 \times \frac{i}{2}} \right)^6 \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{1}{2} \times 4 \times 2^{5/2-3} \times \frac{1}{\left(1.29927 \times \frac{i}{2} + \frac{1}{2}\right)^6} \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right) \times \frac{1}{24}}}$$

i is the imaginary unit

Result:

$$1.14553... +$$

$$1.16589... i$$

Polar coordinates:

$r = 1.63448$ (radius), $\theta = 45.5049^\circ$ (angle)

1.63448 result very near to the mean between $\zeta(2) = \frac{\pi^2}{6} = 1.644934 \dots$ and the value of golden ratio $1.61803398\dots$, i.e. 1.63148399

Alternative representations:

$$\frac{64 - 8}{\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{1.29927 i} \right)^6 \exp\left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24}} = \frac{56}{\frac{8 - \frac{1}{2} e^{90^\circ (4+1/24)(8+1/24)} \left(\frac{1}{0.649635 i} \right)^6}{\frac{2 e^{90^\circ (4+1/24)(8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}}$$

$$\frac{64 - 8}{\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{1.29927 i} \right)^6 \exp\left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24}} = \frac{56}{\frac{8 - \frac{1}{2} e^{-1/2 i \log(-1)(4+1/24)(8+1/24)} \left(\frac{1}{0.649635 i} \right)^6}{\frac{2 e^{-1/2 i \log(-1)(4+1/24)(8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}}$$

$$\frac{64 - 8}{\frac{\frac{16}{2} - 2^{5-6} \left(\frac{1}{1.29927 i} \right)^6 \exp\left(-\frac{1}{2} (-1) \left(\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{\frac{(4 \times 2^{5/2-3}) \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right)\right)}{2 \left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24}} = \frac{56}{\frac{8 - \frac{1}{2} e^{i \log\left(\frac{1-i}{1+i}\right)\left(4+\frac{1}{24}\right)\left(8+\frac{1}{24}\right)} \left(\frac{1}{0.649635 i} \right)^6}{\frac{2 e^{i \log\left(\frac{1-i}{1+i}\right)\left(4+\frac{1}{24}\right)\left(8+\frac{1}{24}\right)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}}$$

And again:

$$11[(((1/2 \cdot 16 - 2^{5-6}) * (1/(1.29927 \cdot i/2))^6 * e^{-((\pi/2) * 1 * (2 \cdot 4 + (1/24))(2 \cdot 2 + 1/24))})) / (((1/2 \cdot 4 * 2^{5/2-3}) * 1/((1.29927 \cdot i/2 + 1/2)^6) * e^{-((\pi/2) * -(2 \cdot 4 + 1/24)(2 \cdot 2 + 1/24))}) * 1/24)))]$$

Input interpretation:

$$11 \times \frac{\frac{1}{2} \times 16 - 2^{5-6} \left(\frac{1}{1.29927 \times \frac{i}{2}} \right)^6 \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right)}{\frac{1}{2} \times 4 \times 2^{5/2-3} \times \frac{1}{\left(1.29927 \times \frac{i}{2} + \frac{1}{2}\right)^6} \exp\left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24}\right) \left(2 \times 2 + \frac{1}{24}\right)\right)\right) \times \frac{1}{24}}$$

i is the imaginary unit

Result:

$$264.134... - \\ 268.830... i$$

Polar coordinates:

$$r = 376.877 \text{ (radius)}, \quad \theta = -45.5049^\circ \text{ (angle)}$$

[376.877](#) result very near to the value of the Phi frequencies Table [376.508](#)

Alternative representations:

$$\frac{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp\left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)}{\frac{4 \times 2^{5/2-3} \exp\left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)}} =$$

$$\frac{11 \left(8 - \frac{1}{2} e^{90^\circ (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i} \right)^6 \right)}{\frac{2 e^{90^\circ (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}$$

$$\frac{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)}{\frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927i}{2} + \frac{1}{2} \right)^6 24 \right)}} =$$

$$\frac{11 \left(8 - \frac{1}{2} e^{-1/2 i \log(-1) (4+1/24) (8+1/24)} \left(\frac{1}{0.649635 i} \right)^6 \right)}{\frac{2 e^{-1/2 i \log(-1) (4+1/24) (8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}$$

$$\frac{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)}{\frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927i}{2} + \frac{1}{2} \right)^6 24 \right)}} =$$

$$\frac{11 \left(8 - \frac{1}{2} e^{i \log \left(\frac{1-i}{1+i} \right) \left(4 + \frac{1}{24} \right) \left(8 + \frac{1}{24} \right)} \left(\frac{1}{0.649635 i} \right)^6 \right)}{\frac{2 e^{i \log \left(\frac{1-i}{1+i} \right) \left(4 + \frac{1}{24} \right) \left(8 + \frac{1}{24} \right)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}}$$

609.201/(11[(((1/2*16-2^(5-6) * (1/(1.29927*i/2))^6 * e^(-((Pi/2)*-1*(2*4+(1/24))(2*2+1/24)))))/(((1/2*4*2^(5/2-3)*1/((1.29927*i/2+1/2)^6)*e^(-((Pi/2)*-(2*4+1/24)(2*2+1/24)))*1/24)))]])

Where 609.201 is a value of the Phi frequencies Table

Input interpretation:

$$\frac{609.201}{11 \times \frac{\frac{1}{2} \times 16 - 2^{5-6} \left(\frac{1}{1.29927 \times \frac{i}{2}} \right)^6 \exp \left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{\frac{1}{\frac{1}{2} \times 4 \times 2^{5/2-3} \times \left(\frac{1}{1.29927 \times \frac{i}{2} + \frac{1}{2}} \right)^6 \exp \left(-\left(\frac{\pi}{2} \times (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \times \frac{1}{24}}}}$$

i is the imaginary unit

Result:

1.13288... +
1.15303... i

Polar coordinates:

$r = 1.61644$ (radius), $\theta = 45.5049^\circ$ (angle)

1.61644 result that is a very good approximation to the value of the golden ratio
1.618033988749...

Alternative representations:

$$\frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} =$$

$$\frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)}$$

$$\frac{609.201}{11 \left(8 - \frac{1}{2} e^{90^\circ (4+1/24)(8+1/24)} \left(\frac{1}{0.649635 i} \right)^6 \right)}$$

$$\frac{2 e^{90^\circ (4+1/24)(8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}$$

$$\frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} =$$

$$\frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)}$$

$$\frac{609.201}{11 \left(8 - \frac{1}{2} e^{-1/2 i \log(-1)(4+1/24)(8+1/24)} \left(\frac{1}{0.649635 i} \right)^6 \right)}$$

$$\frac{2 e^{-1/2 i \log(-1)(4+1/24)(8+1/24)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}$$

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \frac{609.201}{11 \left(8 - \frac{1}{2} e^{i \log \left(\frac{1-i}{1+i} \right) \left(4 + \frac{1}{24} \right) \left(8 + \frac{1}{24} \right)} \left(\frac{1}{0.649635 i} \right)^6 \right)} \\
& \frac{2 e^{i \log \left(\frac{1-i}{1+i} \right) \left(4 + \frac{1}{24} \right) \left(8 + \frac{1}{24} \right)}}{\sqrt{2} 24 \left(\frac{1}{2} + 0.649635 i \right)^6}
\end{aligned}$$

Series representations:

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \frac{6.52682 i^6 \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k)}{(0.769663 + i)^6 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k) \right)}
\end{aligned}$$

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \frac{6.52682 i^6 \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k)}{(0.769663 + i)^6 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!} \right)^{18721/288} \sum_{k=0}^{\infty} (-1)^k / (1+2k) \right)}
\end{aligned}$$

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \quad 6.52682 i^6 \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721/288} \sum_{k=1}^{\infty} \tan^{-1} (1/F_{1+2k}) \\
& - \frac{(0.769663 + i)^6 \left(-1.20264 i^6 + \left(\sum_{k=0}^{\infty} \frac{1}{k!} \right)^{18721/288} \sum_{k=1}^{\infty} \tan^{-1} (1/F_{1+2k}) \right)}{
\end{aligned}$$

Integral representations:

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \quad 6.52682 e^{18721/576 \times \int_0^{\infty} 1/(1+t^2) dt} i^6 \\
& - \frac{(0.769663 + i)^6 \left(e^{18721/576 \times \int_0^{\infty} 1/(1+t^2) dt} - 1.20264 i^6 \right)}{
\end{aligned}$$

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 24 \right)} \\
& \quad 6.52682 e^{18721/576 \int_0^{\infty} \sin(t)/t dt} i^6 \\
& - \frac{(0.769663 + i)^6 \left(e^{18721/576 \int_0^{\infty} \sin(t)/t dt} - 1.20264 i^6 \right)}{
\end{aligned}$$

$$\begin{aligned}
& \frac{609.201}{11 \left(\frac{16}{2} - 2^{5-6} \left(\frac{1}{\frac{1.29927 i}{2}} \right)^6 \exp \left(-\frac{1}{2} \left(-\pi \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right) \right)} = \\
& \frac{4 \times 2^{5/2-3} \exp \left(-\frac{1}{2} \left(\pi (-1) \left(2 \times 4 + \frac{1}{24} \right) \left(2 \times 2 + \frac{1}{24} \right) \right) \right)}{2 \left(\left(\frac{1.29927 i}{2} + \frac{1}{2} \right)^6 - 24 \right)} \\
& - \frac{6.52682 e^{18.721/288} \int_0^1 \sqrt{1-t^2} dt i^6}{(0.769663 + i)^6 \left(e^{18.721/288} \int_0^1 \sqrt{1-t^2} dt - 1.20264 i^6 \right)}
\end{aligned}$$

Mathematical connections with some sectors of String Theory

From:

Modular equations and approximations to π - Srinivasa Ramanujan
Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

We have that:

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \dots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \dots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \dots = 64\{(1 + \sqrt{2})^{12} + (1 - \sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\dots$$

Again

$$G_{37} = (6 + \sqrt{37})^{\frac{1}{4}},$$

$$\begin{aligned} 64G_{37}^{24} &= e^{\pi\sqrt{37}} + 24 + 276e^{-\pi\sqrt{37}} + \dots, \\ 64G_{37}^{-24} &= 4096e^{-\pi\sqrt{37}} - \dots, \end{aligned}$$

so that

$$64(G_{37}^{24} + G_{37}^{-24}) = e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \dots = 64\{(6 + \sqrt{37})^6 + (6 - \sqrt{37})^6\}.$$

Hence

$$e^{\pi\sqrt{37}} = 199148647.999978\dots$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5 + \sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \dots = 64\left\{\left(\frac{5 + \sqrt{29}}{2}\right)^{12} + \left(\frac{5 - \sqrt{29}}{2}\right)^{12}\right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982\dots$$

From:

An Update on Brane Supersymmetry Breaking

J. Mourad and A. Sagnotti - arXiv:1711.11494v1 [hep-th] 30 Nov 2017

From the following vacuum equations:

$$T e^{\gamma_E \phi} = - \frac{\beta_E^{(p)} h^2}{\gamma_E} e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

$$16 k' e^{-2C} = \frac{h^2 \left(p + 1 - \frac{2\beta_E^{(p)}}{\gamma_E} \right) e^{-2(8-p)C + 2\beta_E^{(p)} \phi}}{(7-p)}$$

$$(A')^2 = k e^{-2A} + \frac{h^2}{16(p+1)} \left(7 - p + \frac{2\beta_E^{(p)}}{\gamma_E} \right) e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

we have obtained, from the results almost equals of the equations, putting

$4096 e^{-\pi\sqrt{18}}$ instead of

$$e^{-2(8-p)C + 2\beta_E^{(p)} \phi}$$

a new possible mathematical connection between the two exponentials. Thence, also the values concerning p , C , β_E and ϕ correspond to the exponents of e (i.e. of exp). Thence we obtain for $p = 5$ and $\beta_E = 1/2$:

$$e^{-6C+\phi} = 4096 e^{-\pi\sqrt{18}}$$

Therefore, with respect to the exponentials of the vacuum equations, the Ramanujan's exponential has a coefficient of 4096 which is equal to 642, while $-6C+\phi$ is equal to $-\pi\sqrt{18}$. From this it follows that it is possible to establish mathematically, the dilaton value.

For

$\exp((- \pi \sqrt{18}))$ we obtain:

Input:

$$\exp\left(-\pi \sqrt{18}\right)$$

Exact result:

$$e^{-3\sqrt{2}\pi}$$

Decimal approximation:

$$1.6272016226072509292942156739117979541838581136954016... \times 10^{-6}$$

$$1.6272016... * 10^{-6}$$

Property:

$e^{-3\sqrt{2}\pi}$ is a transcendental number

Series representations:

$$e^{-\pi \sqrt{18}} = e^{-\pi \sqrt{17} \sum_{k=0}^{\infty} 17^{-k} \binom{1/2}{k}}$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\pi \sqrt{17} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\frac{\pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s} \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{2\sqrt{\pi}}\right)$$

Now, we have the following calculations:

$$e^{-6C+\phi} = 4096e^{-\pi \sqrt{18}}$$

$$e^{-\pi \sqrt{18}} = 1.6272016... * 10^{-6}$$

from which:

$$\frac{1}{4096} e^{-6C+\phi} = 1.6272016... * 10^{-6}$$

$$0.000244140625 e^{-6C+\phi} = e^{-\pi\sqrt{18}} = 1.6272016... * 10^{-6}$$

Now:

$$\ln(e^{-\pi\sqrt{18}}) = -13.328648814475 = -\pi\sqrt{18}$$

And:

$$(1.6272016 * 10^{-6}) * 1 / (0.000244140625)$$

Input interpretation:

$$\frac{1.6272016}{10^6} \times \frac{1}{0.000244140625}$$

Result:

0.0066650177536

0.006665017...

Thence:

$$0.000244140625 e^{-6C+\phi} = e^{-\pi\sqrt{18}}$$

Dividing both sides by 0.000244140625, we obtain:

$$\frac{0.000244140625}{0.000244140625} e^{-6C+\phi} = \frac{1}{0.000244140625} e^{-\pi\sqrt{18}}$$

$$e^{-6C+\phi} = 0.0066650177536$$

$$((((\exp((- \pi \sqrt{18})))))) * 1/0.000244140625$$

Input interpretation:

$$\exp\left(-\pi \sqrt{18}\right) \times \frac{1}{0.000244140625}$$

Result:

0.00666501785...

0.00666501785...

Series representations:

$$\frac{\exp(-\pi \sqrt{18})}{0.000244141} = 4096 \exp\left(-\pi \sqrt{17} \sum_{k=0}^{\infty} 17^{-k} \left(\frac{1}{2}\right)_k\right)$$

$$\frac{\exp(-\pi \sqrt{18})}{0.000244141} = 4096 \exp\left(-\pi \sqrt{17} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp(-\pi \sqrt{18})}{0.000244141} = 4096 \exp\left(-\frac{\pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s} \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{2 \sqrt{\pi}}\right)$$

Now:

$$e^{-6C+\phi} = 0.0066650177536$$

$$\exp\left(-\pi \sqrt{18}\right) \times \frac{1}{0.000244140625} =$$

$$e^{-\pi \sqrt{18}} \times \frac{1}{0.000244140625}$$

$$= 0.00666501785...$$

From:

$$\ln(0.00666501784619)$$

Input interpretation:

$$\log(0.00666501784619)$$

Result:

$$-5.010882647757\dots$$

$$-5.010882647757\dots$$

Alternative representations:

$$\log(0.006665017846190000) = \log_e(0.006665017846190000)$$

$$\log(0.006665017846190000) = \log(a) \log_a(0.006665017846190000)$$

$$\log(0.006665017846190000) = -\text{Li}_1(0.993334982153810000)$$

Series representations:

$$\log(0.006665017846190000) = -\sum_{k=1}^{\infty} \frac{(-1)^k (-0.993334982153810000)^k}{k}$$

$$\log(0.006665017846190000) = 2 i \pi \left\lfloor \frac{\arg(0.006665017846190000 - x)}{2 \pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.006665017846190000 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(0.006665017846190000) = \left\lfloor \frac{\arg(0.006665017846190000 - z_0)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(0.006665017846190000 - z_0)}{2 \pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.006665017846190000 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$\log(0.006665017846190000) = \int_1^{0.006665017846190000} \frac{1}{t} dt$$

In conclusion:

$$-6C + \phi = -5.010882647757 \dots$$

and for $C = 1$, we obtain:

$$\phi = -5.010882647757 + 6 = \mathbf{0.989117352243} = \phi$$

Note that the values of n_s (spectral index) 0.965, of the average of the Omega mesons Regge slope 0.987428571 and of the dilaton 0.989117352243, are also connected to the following two Rogers-Ramanujan continued fractions:

$$\frac{e^{\frac{\pi}{5}}}{\sqrt{(\phi-1)\sqrt{5}} - \phi + 1} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \dots}}}} \approx 0.9568666373$$

$$\frac{e^{\frac{\pi}{\sqrt{5}}}}{\sqrt{5} - \phi + 1} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

(<http://www.bitman.name/math/article/102/109/>)

The mean between the two results of the above Rogers-Ramanujan continued fractions is 0.97798855285, value very near to the ψ Regge slope 0.979:

Ψ		3		$m_c = 1500$		0.979		-0.09
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Also performing the 512th root of the inverse value of the Pion meson rest mass 139.57, we obtain:

$$((1/(139.57)))^{1/512}$$

Input interpretation:

$$\sqrt[512]{\frac{1}{139.57}}$$

Result:

0.990400732708644027550973755713301415460732796178555551684...

0.99040073.... result very near to the dilaton value **0.989117352243 = ϕ** and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\sqrt{5}}}{1 + \sqrt[5]{\sqrt{\phi^5 \sqrt[4]{5^3}} - 1}} = 1 - \frac{e^{-\pi\sqrt{5}}}{1 + \frac{e^{-2\pi\sqrt{5}}}{1 + \frac{e^{-3\pi\sqrt{5}}}{1 + \frac{e^{-4\pi\sqrt{5}}}{1 + \dots}}}} \approx 0.9991104684$$

From

AdS Vacua from Dilaton Tadpoles and Form Fluxes - *J. Mourad and A. Sagnotti*
- arXiv:1612.08566v2 [hep-th] 22 Feb 2017 - March 27, 2018

We have:

$$e^{2C} = \frac{2\xi e^{\frac{\phi}{2}}}{1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}}$$

$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi} \left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5 T e^{2\phi} \right]. \quad (2.7)$$

For

$$T = \frac{16}{\pi^2}$$

$$\xi = 1$$

we obtain:

$$(2 * e^{(0.989117352243/2)}) / (1 + \sqrt{((1 - 1/3 * 16/(\pi)^2 * e^{(2 * 0.989117352243)}))})$$

Input interpretation:

$$\frac{2 e^{0.989117352243/2}}{1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}}$$

Result:

0.83941881822... -

1.4311851867... *i*

Polar coordinates:

$r = 1.65919106525$ (radius), $\theta = -59.607521917^\circ$ (angle)

1.65919106525..... result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \frac{2 e^{0.4945586761215000}}{1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \binom{\frac{1}{2}}{k}}$$

$$\begin{aligned}
& \frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \\
& \frac{2 e^{0.4945586761215000}}{1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}} \\
& \frac{2 e^{0.9891173522430000/2}}{1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}}} = \\
& \frac{2 e^{0.4945586761215000}}{1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!}} \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

From

$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi} \left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5 T e^{2\phi} \right]$$

we obtain:

$$\begin{aligned}
& e^{(4 \times 0.989117352243) / (((1 + \sqrt{1 - 1/3 \times 16 / (\pi^2 \times e^{(2 \times 0.989117352243))}))^7} \\
& [42(1 + \sqrt{1 - 1/3 \times 16 / (\pi^2 \times e^{(2 \times 0.989117352243))}) + 5 \times 16 / (\pi^2 \times e^{(2 \times 0.989117352243)})]
\end{aligned}$$

Input interpretation:

$$\begin{aligned}
& \frac{e^{4 \times 0.989117352243}}{\left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}\right)^7} \\
& \left(42 \left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}}\right) + 5 \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}\right)
\end{aligned}$$

Result:

50.84107889... –
20.34506335... i

Polar coordinates:

$r = 54.76072411$ (radius), $\theta = -21.80979492^\circ$ (angle)

54.76072411.....

Series representations:

$$\left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 =$$

$$\left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \right.$$

$$\left. \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right) /$$

$$\left(\pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right)^7 \right)$$

$$\left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 =$$

$$\left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right. \right.$$

$$\left. \left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right) /$$

$$\left(\pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)^7 \right)$$

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right)^7 = \\
& \left(2 \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \right. \right. \\
& \quad \left. \left. \pi^2 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) \right) / \\
& \left(\pi^2 \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

From which:

$$\begin{aligned}
& e^{(4 \times 0.989117352243)} / (((1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{(2 \times 0.989117352243)}}))^7 \\
& [42(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{(2 \times 0.989117352243)}}) + 5 \times \frac{16}{\pi^2} e^{(2 \times 0.989117352243)}] \times \frac{1}{34}
\end{aligned}$$

Input interpretation:

$$\begin{aligned}
& \frac{e^{4 \times 0.989117352243}}{\left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}} \right)^7} \\
& \left(42 \left(1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2} e^{2 \times 0.989117352243}} \right) + 5 \times \frac{16}{\pi^2} e^{2 \times 0.989117352243} \right) \times \frac{1}{34}
\end{aligned}$$

Result:

1.495325850... -
0.5983842161... i

Polar coordinates:

$r = 1.610609533$ (radius), $\theta = -21.80979492^\circ$ (angle)

1.610609533.... result that is a good approximation to the value of the golden ratio
1.618033988749...

Series representations:

$$\left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 =$$

$$\left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right.$$

$$\left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) /$$

$$\left(17 \pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \left(\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(\frac{1}{2} \right)_k \right) \right)^7$$

$$\left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 =$$

$$\left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \pi^2 \right.$$

$$\left. \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) /$$

$$\left(17 \pi^2 \left(1 + \sqrt{-\frac{16 e^{1.978234704486000}}{3 \pi^2}} \sum_{k=0}^{\infty} \frac{\left(-\frac{3}{16} \right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2} \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)^7$$

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) + \frac{5 \times 16 e^{2 \times 0.9891173522430000}}{\pi^2} \right) \right. \\
& \quad \left. e^{4 \times 0.9891173522430000} \right) / \left(34 \left(1 + \sqrt{1 - \frac{16 e^{2 \times 0.9891173522430000}}{3 \pi^2}} \right) \right)^7 = \\
& \left(40 e^{5.934704113458000} + 21 e^{3.956469408972000} \pi^2 + 21 e^{3.956469408972000} \right. \\
& \quad \left. \pi^2 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) / \\
& \left(17 \pi^2 \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 - \frac{16 e^{1.978234704486000}}{3 \pi^2} - z_0\right)^k z_0^{-k}}{k!} \right) \right)^7 \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

Now, we have:

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}}, \quad (2.9)$$

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right]^7} \left[42 \left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right) - 13\Lambda e^{2\phi}\right]. \quad (2.10)$$

For:

$$\xi = 1$$

$$\Lambda \simeq \frac{4\pi^2}{25}$$

$$\phi = 0.989117352243$$

From

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}},$$

we obtain:

$$\frac{((2 * e^{(-0.989117352243/2)}))}{((((1 + \sqrt{(1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)})))))}$$

Input interpretation:

$$\frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}}}$$

Result:

0.382082347529...

0.382082347529....

Series representations:

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = 2 / \left(e^{0.4945586761215000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(\frac{1}{2} \right)_k \right) \right)$$

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = 2 / \left(e^{0.4945586761215000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2} \right)_k}{k!} \right) \right)$$

$$\frac{2 e^{-0.9891173522430000/2}}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} = \frac{2}{e^{0.4945586761215000} \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} z_0\right)^k z_0^{-k}}{k!} \right)}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

From which:

$$1 + 1 / (((4 * (2 * e^{(-0.989117352243/2)})) / (((1 + \sqrt{1 + 1/3 * (4 \pi^2)/25 * e^{(2 * 0.989117352243)}}))))))$$

Input interpretation:

$$1 + \frac{1}{4 \times \frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2)\right) e^{2 \times 0.989117352243}}}}$$

Result:

1.65430921270...

1.6543092..... We note that, the result 1.6543092... is very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Indeed:

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5} + 2)^{1/2} \left(\frac{\sqrt{5} + 1}{2} \right)^{1/4} (\sqrt{101} + 10)^{1/4} \\ \times \left((130\sqrt{5} + 29\sqrt{101}) + \sqrt{169440 + 7540\sqrt{505}} \right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5} + 29\sqrt{101}) + \sqrt{169440 + 7540\sqrt{505}} = \left(\sqrt{\frac{113 + 5\sqrt{505}}{8}} + \sqrt{\frac{105 + 5\sqrt{505}}{8}} \right)^3,$$

which is straightforward. $\square$

$$^{14}\sqrt{\left(\sqrt{\frac{113+5\sqrt{505}}{8}} + \sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1,65578 \dots$$

Series representations:

$$1 + \frac{1}{\frac{4 \left(2 e^{-0.9891173522430000/2} \right)}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}} = \\ 1 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \\ \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)_k$$

$$1 + \frac{1}{\frac{4 \left(2 e^{-0.9891173522430000/2} \right)}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}} = \\ 1 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \\ \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!}$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} = 1 + \frac{e^{0.4945586761215000}}{8} +$$

$$\frac{1}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2} \right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0 \right)^k z_0^{-k}}{k!}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

And from

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}} \right]^7} \left[42 \left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}} \right) - 13 \Lambda e^{2\phi} \right].$$

we obtain:

$$e^{(-4 \times 0.989117352243) / [1 + \sqrt{((1 + 1/3 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243))})}]^7 \times [42(1 + \sqrt{((1 + 1/3 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243))})}) - 13 \times (4\pi^2)/25 \times e^{(2 \times 0.989117352243)}]}$$

Input interpretation:

$$\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7 \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right)}$$

Result:

-0.034547055658...

-0.034547055658...

Series representations:

$$\left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \right. \\ \left. - \left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k} \right) / \left(25 e^{5.934704113458000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k} \right)^7 \right) \right) \right)$$

$$\begin{aligned}
& \left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right. \right. \\
& \quad \left. \left. e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \right. \\
& \quad - \left(\left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\
& \quad \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \right) \\
& \left(\left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \frac{1}{25} (4\pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right. \\
& \quad \left. e^{-4 \times 0.9891173522430000} \right) / \left(1 + \sqrt{1 + \frac{(4\pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& \quad - \left(\left(42 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \right. \\
& \quad \left. \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \right) / \left(25 \right. \\
& \quad \left. e^{5.934704113458000} \right. \\
& \quad \left. \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \right) \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

From which:

$$\begin{aligned}
& 47 * 1 / (((-1 / (((((e^{(-4 * 0.989117352243)} / \\
& [1 + \sqrt{((1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}))])^7 * \\
& [42(1 + \sqrt{((1 + 1/3 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}))}) - \\
& 13 * (4\pi^2)/25 * e^{(2 * 0.989117352243)}])])])])])
\end{aligned}$$

Input interpretation:

$$47 \left(- \left(1 / 1 / \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \right. \right. \\ \left. \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right. \right. \right. \right. \\ \left. \left. \left. 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right) \right) \right)$$

Result:

1.6237116159...

1.6237116159.... result that is an approximation to the value of the golden ratio

1.618033988749...

Series representations:

$$\begin{aligned}
 & - \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
 & \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
 & \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
 & \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \\
 & \quad \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
 & \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right) \right) / \left(25 e^{5.934704113458000} \right. \\
 & \quad \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right)^7 \right)
 \end{aligned}$$

$$\begin{aligned}
& - \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \\
& \quad 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \\
& \quad \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \Bigg) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000} \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \\
& - \left(47 / 1 / \left(e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& \left(1974 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \\
& \quad \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \Bigg) / \left(25 e^{5.934704113458000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \\
& \text{for (not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))
\end{aligned}$$

And again:

$$32((((e^{(-4*0.989117352243)} / [1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)})})})^7 * [42(1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)})})}-13*(4\pi^2)/25*e^{(2*0.989117352243)})])]))))$$

Input interpretation:

$$32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right)$$

Result:

-1.1055057810...

-1.1055057810....

We note that the result -1.1055057810.... is very near to the value of Cosmological Constant, less 10^{-52} , thence 1.1056, with minus sign

Series representations:

$$\begin{aligned}
 & \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
 & \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
 & \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
 & - \left(\left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\
 & \quad \left. \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \right. \\
 & \quad \left. \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k} \right) \right) / \left(25 e^{5.934704113458000} \right. \right. \\
 & \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k (e^{1.978234704486000} \pi^2)^{-k} \binom{\frac{1}{2}}{k}} \right)^7 \right) \right)
 \end{aligned}$$

$$\begin{aligned}
& \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& - \left(\left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - \right. \right. \right. \\
& \quad \left. \left. \left. 25 e^{1.978234704486000} \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) / \left(25 e^{5.934704113458000} \right. \right. \\
& \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right)^7 \right) \right)
\end{aligned}$$

$$\begin{aligned}
& \left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = \\
& - \left(\left(1344 \left(-25 e^{1.978234704486000} + 52 e^{3.956469408972000} \pi^2 - 25 e^{1.978234704486000} \right. \right. \right. \\
& \quad \left. \left. \left. \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) \right) / \left(25 e^{5.934704113458000} \right. \right. \\
& \quad \left. \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \right)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

And:

$$- [32(((e^{(-4*0.989117352243)} / [1+\sqrt{(1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)}})]^7 * [42(1+\sqrt{(1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)}})- 13*(4\pi^2)/25*e^{(2*0.989117352243)}])))]^5$$

Input interpretation:

$$- \left[32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \right. \\ \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - \right. \right. \\ \left. \left. \left. \left. \left. 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right) \right) \right) \right)^5 \right]$$

Result:

1.651220569...

1.651220569.... result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)^5 \right) \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)^{35} \right) \right)
\end{aligned}$$

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^5 \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^{35} \right)
\end{aligned}$$

$$\begin{aligned}
& - \left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg)^5 = \\
& \left(4385270057140224 \left(-25 + 52 e^{1.978234704486000} \pi^2 - \right. \right. \\
& \quad \left. \left. 25 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^5 \right) / \\
& \quad \left(9765625 e^{19.78234704486000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^{35} \right)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

We obtain also:

$$-\left[32\left(\frac{e^{-4 \times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}}\right)^7}\right)^7 \times\right. \\ \left.\left[42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}}\right)-\right.\right. \\ \left.\left.13\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}\right)\right]\right]^{1 / 2}$$

Input interpretation:

$$-\sqrt{\left(32\left(\frac{e^{-4 \times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}}\right)^7}\right)^7\right.} \\ \left.\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}}\right)-\right.\right. \\ \left.\left.13\left(\frac{1}{25}\left(4 \pi^2\right)\right) e^{2 \times 0.989117352243}\right)\right)\right)^{1 / 2}$$

Result:

$$-0 \\ 1.0514303501 \dots i$$

Polar coordinates:

$$r=1.05143035007 \text { (radius), } \theta=-90^{\circ} \text { (angle)}$$

1.05143035007

Series representations:

$$\begin{aligned}
 & - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right) - \right. \right. \right. \\
 & \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
 & \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 = -\frac{8}{5} \sqrt{21} \\
 & \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
 & \quad \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right) / \left(e^{3.956469408972000} \right. \right. \\
 & \quad \left. \left. \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \binom{\frac{1}{2}}{k} \right)^7 \right) \right)
 \end{aligned}$$

$$\begin{aligned}
& - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = -\frac{8}{5} \sqrt{21} \\
& \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\
& \quad \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) / \right. \\
& \quad \left. \left(e^{3.956469408972000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \right. \\
& \quad \left. \left. \left. \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k (e^{1.978234704486000} \pi^2)^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)^7 \right) \right) \Bigg) \\
& - \sqrt{\left(\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \\
& \quad \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) / \\
& \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\
& -\frac{8}{5} \sqrt{21} \sqrt{\left(\left(25 - 52 e^{1.978234704486000} \pi^2 + \right. \right. \\
& \quad \left. \left. 25 \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right) / \right. \\
& \quad \left(e^{3.956469408972000} \right. \\
& \quad \left. \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!} \right)^7 \right) \Bigg)
\end{aligned}$$

for (not $(z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0)$)

$$1 / -[32((((e^{(-4*0.989117352243)} / [1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)})})}]^7 * [42(1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243)})})}-13*(4\pi^2)/25*e^{(2*0.989117352243)}))])])])^{1/2}$$

Input interpretation:

$$- \left[1 / \left(\sqrt[3]{32 \left(\frac{e^{-4 \times 0.989117352243}}{\left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right)^7} \right. \right. \right. \\ \left. \left. \left(42 \left(1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}} \right) - \right. \right. \right. \right. \\ \left. \left. \left. 13 \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243} \right) \right) \right) \right) \right]$$

Result:

0.95108534763... *i*

Polar coordinates:

$r = 0.95108534763$ (radius), $\theta = 90^\circ$ (angle)

0.95108534763

We know that the primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

Thence 0.95108534763 is a result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}}-\varphi+1} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \dots}}}} \approx 0.9568666373$$

Series representations:

$$\begin{aligned} & - \left[1 / \left(\sqrt{\left(32 e^{-4 \times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} - \right. \right. \right. \right. \right. \right. \\ & \quad \left. \left. \left. \left. \frac{1}{25} (4 \pi^2) 13 e^{2 \times 0.9891173522430000} \right) \right) \right) \right) \right] / \\ & \quad \left(1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}} \right)^7 \Bigg) = \\ & - \left[5 / \left(8 \sqrt{21} \sqrt{\left(25 - 52 e^{1.978234704486000} \pi^2 + 25 \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \right. \\ & \quad \left. \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right) \right) \right) \right] / \\ & \quad \left(e^{3.956469408972000} \left(1 + \sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75}} \right. \right. \\ & \quad \left. \left. \left. \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right) \right) \right)^7 \right) \Bigg) \end{aligned}$$

$$-\left(5/\left(8\sqrt{21}\sqrt{\left(25-52e^{1.978234704486000}\pi^2+25\sqrt{\frac{4e^{1.978234704486000}\pi^2}{75}}\right)}\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

$$= -0.034547055658\dots$$

$$1+1/(((4((2*e^{(-0.989117352243/2)})) / (((1+\sqrt{((1+1/3*(4\pi^2)/25*e^{(2*0.989117352243))}})))))) + (-0.034547055658)$$

Input interpretation:

$$1 + \frac{1}{4 \times \frac{2 e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3} \left(\frac{1}{25} (4 \pi^2) \right) e^{2 \times 0.989117352243}}}} - 0.034547055658$$

Result:

1.61976215705...

1.61976215705..... result that is a very good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 =$$

$$\frac{1}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}$$

$$0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000}$$

$$\sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75} \sum_{k=0}^{\infty} \left(\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(\frac{1}{2} \right)_k}$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 =$$

$$\frac{1}{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}$$

$$0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} + \frac{1}{8} e^{0.4945586761215000}$$

$$\sqrt{\frac{4 e^{1.978234704486000} \pi^2}{75} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4} \right)^k \left(e^{1.978234704486000} \pi^2 \right)^{-k} \left(-\frac{1}{2} \right)_k}{k!}}$$

$$1 + \frac{1}{4 \left(2 e^{-0.9891173522430000/2} \right)} - 0.0345470556580000 =$$

$$\frac{1 + \sqrt{1 + \frac{(4 \pi^2) e^{2 \times 0.9891173522430000}}{3 \times 25}}}{0.9654529443420000 + \frac{e^{0.4945586761215000}}{8} +$$

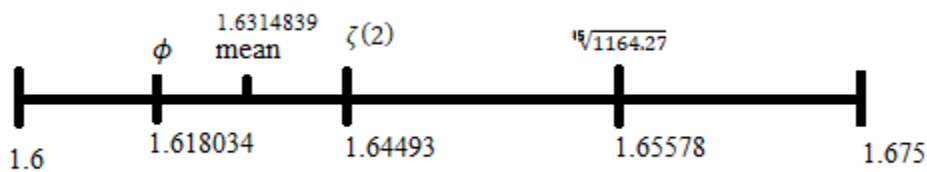
$$\frac{1}{8} e^{0.4945586761215000} \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4 e^{1.978234704486000} \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

Observations

We note that various results highlighted in blue belong to the following range:

“Golden” Range



Furthermore for all the results very near to 1728 or 1729, adding 64, one obtain values about equal to 1792 or 1793. These are values almost equal to the Planck multipole spectrum frequency 1792.35

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March 27, 2018

AdS Vacua from Dilaton Tadpoles and Form Fluxes
J. Mourad and A. Sagnotti - arXiv:1612.08566v2 [hep-th] 22 Feb 2017